

REMARKS

In the Claims

Claims 1-20 are pending in the Application and stand rejected for the reasons discussed below. Also, claims 1, 3, 6-9 and 13 were objected to.

I. Claim objections

Claims 1, 3, 6-9 and 13 were objected to because of certain informalities.

Claim 1 was objected to because the term “continuous mode” was recited both with and without a hyphen. Claim 1 has been amended so that the term “continuous mode” is recited in all cases without a hyphen.

Claims 3, 6, 7, 8, 9 and 13 were objected to because they included lettered paragraphs a), b), etc. Claims 3, 6, 7, 8 and 9 have been amended to remove the letters.

Claim 13 is an independent claim and Applicants respectfully submit that the lettered paragraphs do not represent an informality with respect to this particular claim since claims 14-18 depending from claim 13 do not have lettered paragraphs.

Applicants respectfully submit that the amendments to the above-identified claims and the reasons set forth above overcome the objection to claims 1, 3, 6-9 and 13. Withdrawal of the objections to these claims is earnestly requested.

II. Claim Rejection under 35 USC § 112

Claim 11 stands rejected under 35 USC § 112(b) as being indefinite for use of the term “and/or” and also because of the use of the term “controllers” as plural.

Claim 11 has been amended to replace the term “and/or” with the word “and”.

Applicants respectfully submits that the use of the word “controllers” in the last

paragraph of the claim is not indefinite because a closer reading of claim 11 reveals that limitations a) through e) apply to **each** QKD of the first and second QKD stations, so that there are in fact **two** controllers.

Applicants respectfully submit that the amendment to claim 11 and the reason set forth above with respect to the singular and plural use of the word "controller" overcomes the rejection to claim 11 under 35 USC § 112, and withdrawal of this rejection of claim 11 is earnest requested.

III. Claim Rejection under 35 USC § 102(b)

Claims 1, 2 and 10 stand rejected under 35 USC §102(b) as being anticipated by USP 5,675,648 to Townsend ("Townsend '648").

"Anticipated" means that all of the elements and limitations of a given claim are described in a single prior art reference. See *e.g.*, *Akzo N.V. v. U.S. Int'l Trade Comm'n*, 808 F.2d 1471, 1479 (Fed.Cir.1986) ("Under 35 U.S.C. § 102, anticipation requires that each and every element of the claimed invention be disclosed in a prior art reference.").

Applicants' remarks under the heading "Review of Townsend '648" from the previous office action response are incorporated herein by reference.

In the "Response to Arguments" section beginning on page 2 of the Second Office Action, the Examiner states that a "continuous mode" of transmission is taught in the Townsend '648 patent in col. 8, lines 26-30. This portion of the '648 patent, along with lines 31 and 32, is reproduced below:

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As an alternative to, or in addition to, the use of a distinct
initial timing/calibration phase, timing and calibration infor-
mation may be sent concurrently with the quantum key
information. This may be done, for example, by controlling
30 the attenuator to increase the intensity of every p_{ph} pulse.
This pulse would then contain sufficient photons to guaran-
tee that it is detected by all the receivers on the network.

Applicants respectfully submit that lines 31 and 32 as well as the text surrounding this portion of the specification are crucial in understanding how the “alternative” to a “distinct timing/calibration phase” would actually work in practice. Specifically, the fact that the occasional strong p_{th} pulse is detected by ***all receivers on the network*** means that there is an ***interruption*** in detecting the weaker (i.e., 0.1 photon pulses, or what Applicants call “quantum signals”) because the APDs need to be set to be reversed biased well below the breakdown voltage when detecting such strong pulses, as described in col. 8, lines 6 - 13, as well as in col. 8, lines 40 - 51.

Thus, even in this alternate mode, the only way the transmitter and receiver can share timing information is by ***interrupting*** the transmission of “weak” pulses by adjusting the attenuator to insert an occasional “strong” multi-photon pulse, as stated in col. 8, lines 26-32. This is still a ***switched*** mode and ***not a continuous mode*** because the flow of weak pulses is ***interrupted*** by having to insert the occasional “strong” multi-photon pulse for timing purposes. In other words, the interruption of the transmission of what Applicants called “quantum signals,” by definition renders the Townsend ‘648 method ***non-continuous***.

Applicant has amended claim 1 to clarify this distinction by including the limitation that in the continuous mode “the quantum signals are not interrupted by non-quantum optical timing signals.”

The Examiner also notes that col. 8, lines 53-57 mentions encoding the timing/calibration signals in separate wavelengths. The Examiner further notes that col. 9, lines 35-42 “suggests” the use of two independent signals and thus two sources.

However, the ***entirety*** of Townsend ‘648 is dedicated to teaching how to perform timing in a ***non-continuous*** mode, and Townsend ‘648 ***lacks enablement*** with respect to the “separate wavelength” approach or the “two sources” approach that are provided as wishful side comments without any support or teaching.

It is well-settled law that prior art cited under 35 USC § 102(b) “must sufficiently describe the claimed invention to have placed the public in possession of it.” *In re Donohue*, 766 F.2d 531, 533 (CAFC 1985); *Paperless Accounting, Inc. v.*

Bay Area Rapid Transit System, 804, F.2d 659, 665 (Fed. Cir. 1986).

Applicants respectfully submit that the 47 words of col. 8, lines 53-57, and the lack of any Figures showing how such a multi-wavelength system would actually work in practice cannot reasonably said to have placed this aspect of the invention in the public domain. Likewise, the “suggestion” of using two independent signals and two sources as an alternative is offered without any details and constitutes a non-enabled “idea” and not an enabled “invention.”

Proffering ideas as side comments about what might be alternative approaches to an actual disclosed and enabled invention does **not** render the **alternatives** enabled. Such alternatives **must include their own enablement** and cannot be said to be in the public domain unless they are so enabled.

Applicants respectfully submit that the above-cited portions of Townsend ‘648 relied upon by the Examiner in rejecting claim 1 fall far short of the level of enablement needed for them to qualify as anticipating prior art under 35 USC §102(b).

For the above reasons, Applicants respectfully submit that claim 1 as amended is patentable over the cited prior art, and respectfully request withdrawal of the anticipation rejection under 35 USC §102(b) of claim 1, as well as claims 2 and 10 depending therefrom.

IV. Claim Rejections under 35 USC § 103

Claims 3-9 depending from claim 1

Dependent claims 3-9 stand rejected based on combinations of Townsend ‘648 in combination with either USP 5,111,451 to Piasecki (hereinafter “Piasecki”) or in view of USP 5,307,410 to Bennett (hereinafter “Bennett”).

Applicants respectfully submit that claims 3-9 depending from claim 1 are patentable for the same reasons discussed above that render claim 1 patentable over Townsend, and thus respectfully request withdrawal of the obviousness

rejection of claims 3-9.

Claims 11, 12 and 13 and related dependent claims

Independent claims 11, 12 and 13 stand rejected as being obvious under 35 USC §103(a). An obvious rejection under 35 USC §103(a) requires that the combination of cited references yield all of the claim limitations.

Claim 11 stands rejected based on Townsend '648 in view of Bennett

Claims 12 and 13 stand rejected based on Townsend '648 in view of Piasecki.

Independent claims 11, 12 and 13 have been amended to include the same new limitation added to claim 1, namely that quantum signals are sent over the quantum channel ***in a continuous mode wherein the quantum signals are not interrupted by non-quantum optical timing signals.*** Applicants respectfully submit that this amendment distinguishes claims 11, 12 and 13 from Townsend for the same reasons discussed above in connection with the anticipation rejection of claim 1.

Applicants therefor respectfully submit that independent claims 11, 12 and 13 as amended are patentable over the cited prior art, and respectfully request withdrawal of the obviousness rejection under 35 USC §103(a) of these claims, as well as claims 14-18 that depend from claim 13 and claims 19 and 20 that depend from claim 11.

CONCLUSION


Applicants respectfully submit that the amendments to the independent claims, along with the arguments set forth above, place claims 1-20 as presently presented are in condition for allowance.

As such, Applicants respectfully request withdrawal of the objections to claims 1, 3, 6-9 and 13, withdrawal of the anticipation rejection of claims 1, 2 and 10, the withdrawal of the obvious rejections for the remainder of the claims, and the issuance of a Notice of Allowance in due course for the pending claims 1-20.

The Examiner is encouraged to contact the Assignee's authorized representative at 941-378-2744 to discuss any questions that may arise in connection with this Amendment.

Applicant believes that a **three-month** extension of time extension pursuant to 37 C.F.R. § 1.136(a) in the amount of **\$555** (small entity) is necessary to make this Reply timely, and hereby authorizes the Office to charge any necessary fee or surcharge with respect to said time extension to Deposit Account **502992**

Respectfully Submitted,

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